35.—Cyclophorus (Ditropis) Beddomei.

Shell sub-orbicular, depressed, thin, whitish brown, striæ rather rugose, whorls $3\frac{1}{2}$, the last large and flattened in front, having two distinct spiral keels, one above the periphery and contiguous to the suture, the other below, leaving a passage between them; the upper whorls smooth and convex, spire short, apex obtuse, base angular, umbilicus wide and deep, encircled with a keel, and having one well down, aperture oblique, somewhat circular, peristome thickened, brown, margins approximating and joined by a thin callus plate, the right or upper considerably thickened, the basal margin produced outwardly, columellar hollowed out and slightly reflected at the umbilicus.

Diam. Maj. $\frac{3}{4}$, min. $\frac{2}{3}$, alt. $\frac{1}{2}$ lin.

Hab. Cape York, North Australia.

This species differs from *Cyclophorus Whitei*, Brazier, by being more depressed, the keels only being contiguous to the suture of the last whorl, and in the upper whorls being smooth, and the peristome thicker; it is in all respects a smaller shell.

Notes on a collection of geological specimens collected by William Macleay, Esq., F.L.S., President of the New South Wales Linnean Society, Sydney, from the coasts of New Guinea, Cape York, and neighbouring islands—by C. S. Wilkinson, Government Geologist.

I have lately examined a small collection of geological specimens, brought from the coast of New Guinea, by the President of this Society, Mr. William Macleay, and which were collected by him when on his recent tour of exploration in the Chevert.

These specimens consist of—

1. Quartz porphyry (Palæozoic), from Cape York, found underlying beds of Tertiary ferruginous sandstone.
2. Vesicular basalt and brecciated volcanic tufa (Upper Tertiary), from Darnley Island.

3. Small concretions of limonite, with polished looking surfaces, dredged up off the coast of New Guinea.
4. Specimens of chalcedony and flint, from Hall's Sound.
5. Oolite limestone (Tertiary), very friable, from Bramble Bay.
6. Yellow calcareous (Tertiary), clay, from Katau River.
7. Yellow and blue calcareous clays (Tertiary), from Yule Island and Hall's Sound.

It is with reference more particularly to the fossiliferous clays that I would offer a few remarks.

These clays, as indicated by the fossils contained in them, belong to the Lower Miocene Tertiary period.

So far as I am aware, this is the first notice of such fossils having been discovered in New Guinea; and this discovery of Mr. Macleay's is the more interesting inasmuch as the Miocene *marine* beds, which occupy a considerable area in Victoria and South Australia, have nowhere been found on the eastern coast of Australia, north of the Victorian border—Cape Howe. Referring to this fact the Rev. W. B. Clarke says that, "throughout the whole of Eastern Australia, including New South Wales and Queensland, no Tertiary *marine* deposits have been discovered."

The comparison of this Miocene fauna from a locality so near the Equator, with that from higher latitudes, will be important work for a palæontologist.

Professor M'Coy has already gone far to prove from the comparison of certain Miocene fossils, that the fauna of the Older Tertiary period in Australia was not so restricted in its geographical range as it now is, but was then closely related generically, and even specifically, to many parts of Europe and America. And I think that, perhaps, even the few fossils now before us may afford some additional evidence in confirmation of the views of that eminent Palæontologist.

The Miocene clay beds of New Guinea, judging from the specimens collected by Mr. Macleay, are exactly similar in lithological character to the Lower Miocene beds near Geelong, and on the Cape Otway coast in Victoria.

The fossils from Hall's Sound are unfortunately not in a good

state of preservation, being mostly imperfect casts ; but amongst them appear to be the following genera :—

Voluta macroptera, a small specimen; *Voluta anti-cingulata*, *Ostrea*, *Cytherœa*, *Crassatella ?* *Pecten*, *Turritella*, *Natica*, *Triton?* *Dolium?* *Astarte*, *Corbula*, *Lœda*, *Venus*, *Cypræa*, 2 *Echinoderms*.

Most of the above I have found in the Victorian beds, and two of them have been figured and described by Professor McCoy in his *Decade No.* 1 *of the Palæontology of Victoria*.

The small specimen of calcareous clay from the Katau River on the west side of the Gulf of Papua contains only a few broken fragments of shells ; but it appears to be of the same formation as the clay beds of Hall's Sound or Yule Island.

The oolitic limestone of Bramble Bay I believe to be also of the upper beds of this Miocene formation.

Mr. Macleay, in his letter to the *Sydney Morning Herald* of October 11, 1875, describes the formation of Yule Island as a sedimentary rock, nearly horizontal on the sea face, but with a great dip inwards. The rock itself is calcareous, and composed of corals, shells, echini, &c.—in fact a concrete of fossils resembling the coral rag of Oxford. Mr. D'Albertis also gives a similar description of the formation of Yule Island, and mentions the occurrence of basaltic trap in the valleys, and that the higher portions of the hills, which attain a height of 700 or 800 feet above sea level, are composed of coralline limestone. It is worthy of remark that in Victoria the Miocene strata occur in a similar manner—yellow and blue calcareous clays full of fossil shells, overlaid by thick beds of coralline limestone consisting of an aggregate of comminuted fragments of corals, shells, and echinoderms.

The discovery of these Miocene beds on the southern coast of New Guinea is one of considerable importance. Their occurrence, I believe, suggests the former land-connection of New Guinea with the Australian continent, and this belief is further borne out by the fact of the shallowness of the intervening sea. I am not aware that any Miocene rocks have yet been identified as such on the northern coast of the Cape York Peninsula ; but it is not improbable that the ferruginous sandstone described by Mr. Macleay as

overlying the porphyritic granite at Cape York, and perhaps other Tertiary deposits which may occur in that locality, may be correlated with the Miocene beds on the opposite coast of New Guinea.

Wallace, referring to this subject in his very interesting and valuable work, *The Malay Archipelago*, says:—"It is interesting to observe among the islands themselves how a shallow sea always intimates a recent land connection." . . . "We find that all the islands from Celebes and Lombock eastward exhibit almost as close a resemblance to Australia and New Guinea as the Western Islands do to Asia." And again—"Australia, with its dry winds, its open plains, its stony deserts, and its temperate climate, produces birds and quadrupeds which are closely related to those inhabiting the hot damp luxuriant forests which everywhere clothe the plains and mountains of New Guinea."

Baron von Mueller's remarks on some of the Papuan plants collected by Mr. Macleay are also evidence in favour of the former land connection of New Guinea with Australia, so that our geological evidence is supported by that of zoology and botany.

From geological data it is believed that this continent has not been submerged to any great extent since the Lower Pliocene period; and we know that it has risen a little since the Upper Pliocene epoch, at least in Victoria, for the lava flows of that age, now forming the Werribee Plains, were *submarine* flows. And Mr. Daintree, formerly Government Geologist of Queensland, shows, in his pamphlet on the *Geology of Queensland*, that little upheaval of this portion of Australia has taken place since the volcanic outbursts of a late Tertiary epoch. Now, it is in the Upper Pliocene or Pleistocene deposits that are found the remains of the gigantic marsupials — *Diprotodon*, *Macropus titan*, *Nototherium*, and others; and, as their allied representatives, now occupy both Australia and New Guinea, it is not improbable that those gigantic animals, whose bones are found in Northern Queensland, also roamed in both those countries. And, further, as the luxuriant vegetation and climatic conditions which we suppose to be favourable for the support of those immense

marsupials, still exist in New Guinea, is it rash to conjecture that some of these large creatures may not be living there at the present time? Further researches may prove this.

I will conclude with the following very apposite extract from Wallace's *Malay Archipelago*:—

"From this outline of the subject, it will be evident how important an adjunct natural history is to geology; not only in interpreting the fragments of extinct animals found in the earth's crust, but in determining past changes in the surface which have no geological record. It is certainly a wonderful and unexpected fact, that an accurate knowledge of the distribution of birds and insects should enable us to map out lands and continents which disappeared beneath the ocean long before the earliest traditions of the human race. Wherever the geologist can explore the earth's surface, he can read much of its past history, and can determine, approximately, its latest movements above and below sea level; but, wherever oceans and seas now extend, he can do nothing but speculate on the very limited data afforded by the depth of the waters. Here the naturalist steps in, and enables him to fill up this great gap in the past history of the earth."

MONDAY, 27TH MARCH, 1876.

CAPTAIN STACKHOUSE, in the Chair.

MEMBERS ELECTED.

Eyre Goulburn Ellis, and E. Reading, Esqrs.

The following paper was read:—

List of Land Shells collected during the Chevert Expedition by JOHN BRAZIER, C.M.Z.S.

1.—HELIX (THALASSIA) RUSTICA.

Helix rustica, Pfr. in Zeitscher, f. Malak, 1852, p. 112.
„ „ Pfr. Mon. Helic Viven, 1853, vol. 3, p. 63.